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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/801,593	03/17/2004	Won-chul Bang	Q80075	1917

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EXAMINER	
PARK, EDWARD	

ART UNIT	PAPER NUMBER
2624	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/801,593	BANG ET AL.	
	Examiner	Art Unit	
	EDWARD PARK	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 June 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,4-6,9 and 10* is/are rejected.

7)☒ Claim(s) *2, 3, 7, 8* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. This action is responsive to applicant's amendment and remarks on 6/18/08. Claims 1-10 are currently pending.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. **Claims 1, 6** are rejected under 35 U.S.C. 102(b) as being anticipated by Milner (US 4,862,152).

Regarding **claim 1**, Milner teaches a spatial motion recognition system, comprising:

a motion detection unit for outputting position changes of a body of the system in space as an electric signal based on three-dimensional motions of the system body (Milner: figure 1, numeral 110); and

a control unit for tracking three-dimensional motions of the system body based on the electric signal outputted from the motion detection unit (Milner: figure 2, numeral 200), producing a virtual handwriting plane in three-dimensional space (figures 1, 2; “receivers 120, 130, and 140 are disposed in a plane”; Milner: col. 6, lines 36-37) having the shortest distances (“distance d1..distance d2….. distance d3”; Milner: col. 6, lines 36-68) with respect to respective positions in predetermined time intervals based on three-dimensional track information obtained through tracking (Milner: col. 6, lines 36-68; col. 7, lines 1-6), and projecting the respective positions in the predetermined time intervals onto the virtual handwriting plane to recover the motions in space (“x and y coordinates of the transmitter”; Milner: col. 6, lines 61-67; col. 7, lines 1-6), wherein the virtual handwriting plane is produced virtually in three-dimensional space by being adaptive or based on the tracked position on changes of the body of the system (see fig. 2, numeral 220; col. 3, lines 30-54, computer is adapted such that the position of the transmitter is used to control the position of a cursor 220 on the display).

Regarding **claim 6**, Milner teaches a spatial motion recognition method for a motion recognition system, comprising:

obtaining three-dimensional track information on a system body in space (Milner: figure 1, numeral 110);

producing a virtual handwriting plane virtually in three-dimensional space (figures 1, 2; “receivers 120, 130, and 140 are disposed in a plane”; Milner: col. 6, lines 36-37) having the shortest distances with respect to respective positions in predetermined time intervals based on the obtained three-dimensional

track information (“distance d1..distance d2….. distance d3”; Milner: col. 6, lines 36-68); and

projecting the positions in the predetermined time intervals onto the virtual handwriting plane and recovering the motions in space ("x and y coordinates of the transmitter"; Milner: col. 6, lines 61-67; col. 7, lines 1-6), wherein the virtual handwriting plane is determined by being adaptive or based on the tracked position on changes of the body of the system (see fig. 2, numeral 220; col. 3, lines 30-54, computer is adapted such that the position of the transmitter is used to control the position of a cursor 220 on the display).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. **Claims 1, 4, 5, 6, 9, 10** are rejected under 35 U.S.C. 103(a) as being unpatentable over Katagiri et al (US 2003/0001818 A1) in view of Sasaki et al (US 5,499,306).

Regarding **claim 1**, Katagiri teaches a motion detection unit for outputting position changes of a body of the system in space as an electric signal based on three-dimensional motions of the system body (Katagiri: figure 11, numeral 120a, 120b); and control unit for tracking three-dimensional motions of the system body based on the electric signal outputted from the motion detection unit (Katagiri: figure 11, numeral 122), and projecting the respective positions in the predetermined time intervals onto the virtual handwriting plane to recover the motions in space (Katagiri: figure 11, numeral 160), wherein the virtual handwriting plane is

produced virtually in three-dimensional space by being adaptive or based on the tracked position on changes of the body of the system (see fig. 11, numeral 160; paragraphs [0291]-[0293], display mans 160 for displaying the input handwritten data which receives time-series data pertaining to coordinates and displaying respective coordinates). Katagiri does not teach producing a virtual handwriting plane in three-dimensional space having the shortest distances with respect to respective positions in predetermined time intervals based on three-dimensional track information obtained through tracking.

Sasaki discloses a system for mapping a collection of 3D points to a 2D display screen, where he teaches producing a virtual plane in three-dimensional space having the shortest distances with respect to respective positions in predetermined time intervals based on three-dimensional track information obtained through tracking (figure 11, numeral 110; Sasaki: col. 15, lines 43-65).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify the Katagiri reference to produce a virtual plane as suggested by Sasaki, to be utilized with a handwriting motion system to "execut[e] the conversion between the coordinates of the 3-D absolute space and the coordinates of the image display screen" (Sasaki: col. 15, lines 43-65).

Regarding **claims 4 and 5**, Katagiri discloses all elements as mentioned above in claim 1. Katagiri does not teach:

a control unit that rotation-converts the tracks of the virtual handwriting plane into a two dimensional plane of *x* and y axes in order to reproduce the tracks projected onto the virtual handwriting plane on the two-dimensional plane; and

a control unit calculates the rotation-converted tracks by the specific equation: wherein (xi', yi', zi') are three-dimensional coordinates when the tracks are segmented in the predetermined time intervals and then the ith position of (xi, yi, zi) is projected on the virtual handwriting plane, and (xi'' yi'', zi'') are coordinates of a point obtained when the ith position of the projected tracks is rotated by θ degrees about the y axis and rotated by φ degrees about the x axis.

Sasaki teaches:

a control unit that rotation-converts the tracks of the virtual plane into a two-dimensional plane of ***x*** and y axes in order to reproduce the tracks projected onto the virtual plane on the two-dimensional plane (Sasaki: col. 9, lines 19-30, lines 59-67); and

a control unit calculates the rotation-converted tracks by the specific equation: wherein (xi', yi', zi') are three-dimensional coordinates when the tracks are segmented in the predetermined time intervals and then the ith position of (xi, yi, zi) is projected on the virtual plane, and (xi'' yi'', zi'') are coordinates of a point obtained when the ith position of the projected tracks is rotated by θ degrees about the y axis and rotated by φ degrees about the x axis (Sasaki: col. 9, lines 59-66; col. 10, lines 1-20).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify the Katagiri reference to rotation-convert the tracks as suggested by Sasaki, to be utilized with a handwriting motion system to allow the three-dimensional coordinates to be projected from the "projective plane to the image display plane" (Sasaki: col. 9, lines 19-30).

Regarding **claim 6**, Katagiri teaches obtaining three-dimensional track information on a system body in space (Katagiri: figure 1, numeral 20); and projecting the positions in the

predetermined time intervals onto the virtual handwriting plane and recovering the motions in space (Katagiri: figure 11, numeral 160), wherein the virtual handwriting plane is determined by being adaptive or based on the tracked position on changes of the body of the system (see fig. 11, numeral 160; paragraphs [0291]-[0293], display mans 160 for displaying the input handwritten data which receives time-series data pertaining to coordinates and displaying respective coordinates). Katagiri does not teach producing a virtual handwriting plane virtually in three-dimensional space having the shortest distances with respect to respective positions in predetermined time intervals based on the obtained three-dimensional track information.

Sasaki teaches producing a virtual plane virtually in three-dimensional space having the shortest distances with respect to respective positions in predetermined time intervals based on the obtained three-dimensional track information (figure 11, numeral 110; Sasaki: col. 15, lines 43-65).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify the Katagiri reference to produce a virtual plane as suggested by Sasaki, to be utilized with a handwriting motion system to "execut[e] the conversion between the coordinates of the 3-D absolute space and the coordinates of the image display screen" (Sasaki: col. 15, lines 43-65).

Regarding **claims 9 and 10**, Katagiri discloses all elements as mentioned above in claim 6. Katagiri does not teach:

rotation-converting the tracks of the virtual handwriting plane into a two-dimensional plane of x and y axes in order to reproduce the tracks projected onto the virtual handwriting plane on the two-dimensional plane; and

rotation-converted tracks that are calculated by the following equation: wherein (xi', yi', zi') are three-dimensional coordinates when the tracks are segmented in the predetermined time intervals and then the ith position of (xi, yi, zi) is projected on the virtual handwriting plane, and (xi'', yi'', zi'') are coordinates of a point obtained when the ith position of the projected tracks is rotated by θ degrees about the y axis and rotated by φ degrees about the x axis.

Sasaki teaches:

rotation-converting the tracks of the virtual plane into a two-dimensional plane of x and y axes in order to reproduce the tracks projected onto the virtual plane on the two-dimensional plane (Sasaki: col. 9, lines 19-30, lines 59-67); and

rotation-converted tracks that are calculated by the following equation: wherein (xi', yi', zi') are three-dimensional coordinates when the tracks are segmented in the predetermined time intervals and then the ith position of (xi, yi, zi) is projected on the virtual plane, and (xi'', yi'', zi'') are coordinates of a point obtained when the ith position of the projected tracks is rotated by θ degrees about the y axis and rotated by φ degrees about the x axis (Sasaki: col. 9, lines 59-66; col. 10, lines 1-20).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify the Katagiri reference to rotation-converting the tracks as suggested by Sasaki, to be utilized with a handwriting motion system to allow the three-dimensional coordinates to be projected from the "projective plane to the image display plane" (Sasaki: col. 9, lines 19-30).

Allowable Subject Matter

6. **Claims 2, 3, 7, 8,** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Regarding **claim 2**, none of the references of record alone or in combination suggest or fairly teach a control unit that calculates the virtual handwriting having the shortest distances with respect to positions using the specific equation, wherein (xi, yi, zi) are coordinates of the system body that is tracked at a predetermined time in three-dimensional space, and α, β, and γ are parameters for the virtual handwriting plane.

Regarding **claim 3**, none of the references of record alone or in combination suggest or fairly teach a control unit calculates tracks of the positions in the predetermined time intervals that are projected onto the virtual handwriting plane by the specific equation: wherein (xi, yi, zi) are three-dimensional coordinates when the electric signal obtained based on motion occurrences of the system body in the three-dimensional space is divided in the predetermined time intervals, (xi', yi', zi') are coordinates obtained when an arbitrary position of (xi', yi', zi') in the predetermined time intervals are projected onto the virtual handwriting plane, and a, b, c, and d are parameters for the virtual handwriting plane.

Regarding **claim 7**, none of the references of record alone or in combination suggest or fairly teach a virtual handwriting plane that is calculated by the specific equation: wherein (xi, yi, zi) are coordinates of the system body that is tracked at a predetermined time in the three-dimensional space, and α, β, and γ are parameters for the virtual handwriting plane.

Regarding **claim 8**, none of the references of record alone or in combination suggest or

fairly teach positions in the predetermined time intervals that are projected onto the virtual handwriting plane are calculated by the specific equation: wherein (xi, yi, zi) are three-dimensional coordinates at a predetermined time tracked based on motion occurrences of the system body in the three-dimensional space, (xi', yi', zi')are coordinates obtained when an arbitrary position of (xi, yi, zi) is projected onto the virtual handwriting plane, and a, b, c, and d are parameters for the virtual handwriting plane.

Response to Arguments

7. Applicant's arguments filed on 6/18/08, in regards to **claim 1, 6** (Milner) have been fully considered but they are not persuasive. Applicant argues that the Milner reference does not disclose a virtual handwriting plane that is virtually produced in three-dimensional space (see pg. 11, first paragraph). This argument is not considered persuasive since the three receivers (see figure 2, numerals 120, 130, 140, produce a “virtual handwriting plane in three-dimensional space” that is utilized to track and capture position data of the transmitter of figure 2, numeral 150. The virtual handwriting plane is produced in front of the monitor in figure 2, numeral 110 before projecting the respective positions onto the monitor in figure 2, numeral 110. Furthermore, applicant argues that Milner is silent in determining a virtual handwriting plane in space and that there is no intermediate process of producing a virtual handwriting plane in space (see pg. 11, second paragraph). This argument is not considered persuasive since in Milner the receiver frame 110 is constructed in the shape of a letter “L” to fit securely onto the top and side of a rectangular shaped video display device such as a convention monitor or television, where

the receiver frame circuitry determines the position of the transmitter as projected onto the plane of the display (see col. 3, lines 30-54). Afterwards, the computer, in response to position signals from the receiver frame and in accordance with internal instructions from a combination of its hardware, software and firmware responds by providing a video display signals to display 210 such that moving the transmitter in an “X” direction moves cursor 220 in an “X” direction relative to the display and moving the transmitter in a “Y” direction move the cursor in a “Y” direction (see col. 3, lines 30-54).

Regarding **claims 1, 4-6, 9 and 10**, applicant argues hat the claims are distinguishable from the cited references due to the arguments above (see pg. 11, third paragraph). This argument is not considered persuasive since the rejection and the arguments stand and can be seen as mentioned above.

Conclusion

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to EDWARD PARK whose telephone number is (571)270-1576. The examiner can normally be reached on M-F 10:30 - 20:00, (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vikkram Bali can be reached on (571) 272-7415. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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Art Unit 2624

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